# THE WEATHER OF 1939 IN THE UNITED STATES

By R. J. MARTIN

[Weather Bureau, Washington, D. C. February 1940]

The year 1939 averaged slightly cooler than the preceding year, but was still warmer than normal nearly everywhere in the United States. Precipitation, particularly during the growing season, was subnormal in large central and eastern areas, and in much of the West. For the year as a whole, only 10 of the 42 climatological sections into which the continental United States is divided received normal or above-normal amounts of moisture. The relatively wettest State was Nevada, with only 110 percent of normal.

Table 1 shows that only one section, New England, comprising the six New England States, had below-normal warmth for the year, and here the negative departure was only 0.4°. The State of New Mexico averaged exactly normal for the year, and all other sections were above normal. The relatively warmest was Nebraska with an excess of 3.2°, followed closely by South Dakota with 3.1°. Over much of the country the year averaged more than 2.5° above the yearly mean.

To a remarkable degree the quantitative distribution of positive temperature departures resembled that of 1938. In keeping with recent trends to abnormally warm weather, the year ended with large positive departures, particularly in northern sections, with Minnesota reporting a December that was 10.7° warmer than normal. In South Dakota the excess for December was 10.0°, and in North Dakota 13.7°.

The lithographic chart shows the annual departures of mean temperature from the normal for the year based on first-order stations only. Table 1 contains section or State means, and is more representative of true conditions. Extremes for the year were well within the record extremes for the United States. The lowest temperature reported was 51° below zero at Meadowlands, Minn., on February 21, and the highest maximum was 123° at Greenland Ranch, Calif., on July 13. (The record extremes of temperature for the United States are 134° at Greenland Ranch, and −66° at Riverside Ranger Station, Yellowstone Park, Wyo.) Temperatures of 100° or above were reported in all sections, except New York and Michigan during the course of the year. In these two States maxima of 98° or 99° were reported. Subzero temperatures occurred in all but about seven Southeastern States.

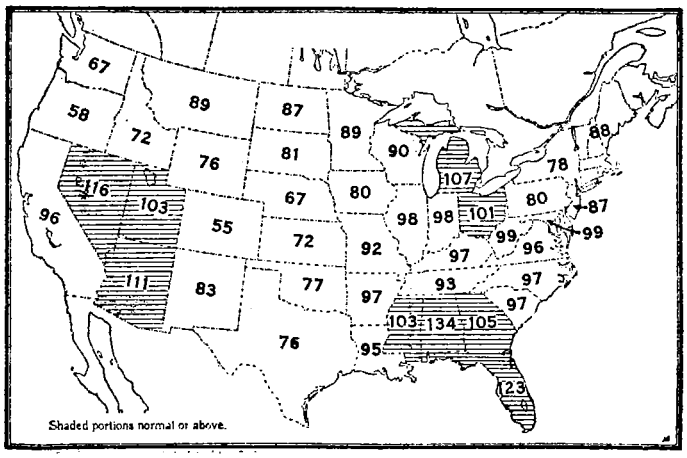



FIGURE 1.—Percentage of normal precipitation, by sections, for the growing season, April 1-September 30, 1939.

Figure 1 shows the percentage of normal precipitation for the growing season, April 1–September 30, 1939. It will be noted that amounts for this 6-month period were above normal in portions of the Plateau and Great Basin area, and also in much of the Southeast from the Mississippi eastward, and were near normal to slightly above in portions of the Ohio Valley and Lake region. The greatest deficiency was in Colorado where some of the year's duststorms were locally as severe as in any previous year. The far Northwest was dry, and other comparatively low percentages occurred in the central and southern Great Plains. In the Northeast, New York, with 78 percent of the normal rainfall for the growing season, was the driest section.

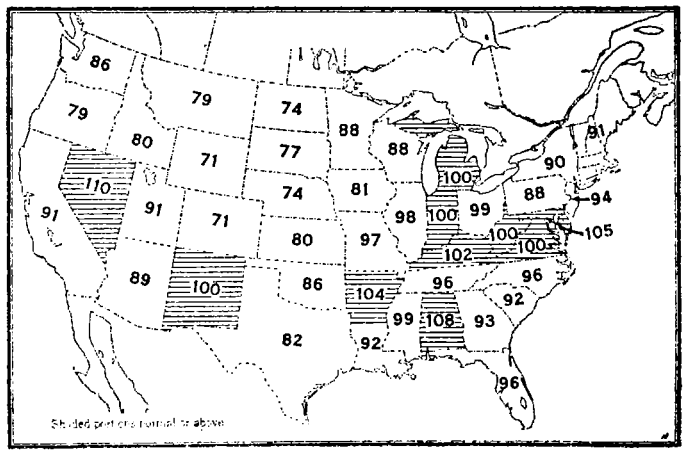



FIGURE 2.—Percentage of normal precipitation, by sections, for the year.

Figure 2 gives the percentage of normal precipitation, by sections, for the year. Only three States west of the Mississippi River were normal or above, while seven sections to east of the Mississippi were normal or above. The relatively wettest State was Nevada with 110 percent of normal.

Deficiencies were most marked in western districts, particularly in the central and northern Great Plains and central Rocky Mountain sections. The relatively driest States were Colorado and Wyoming, each with 71 percent of the usual annual fall.

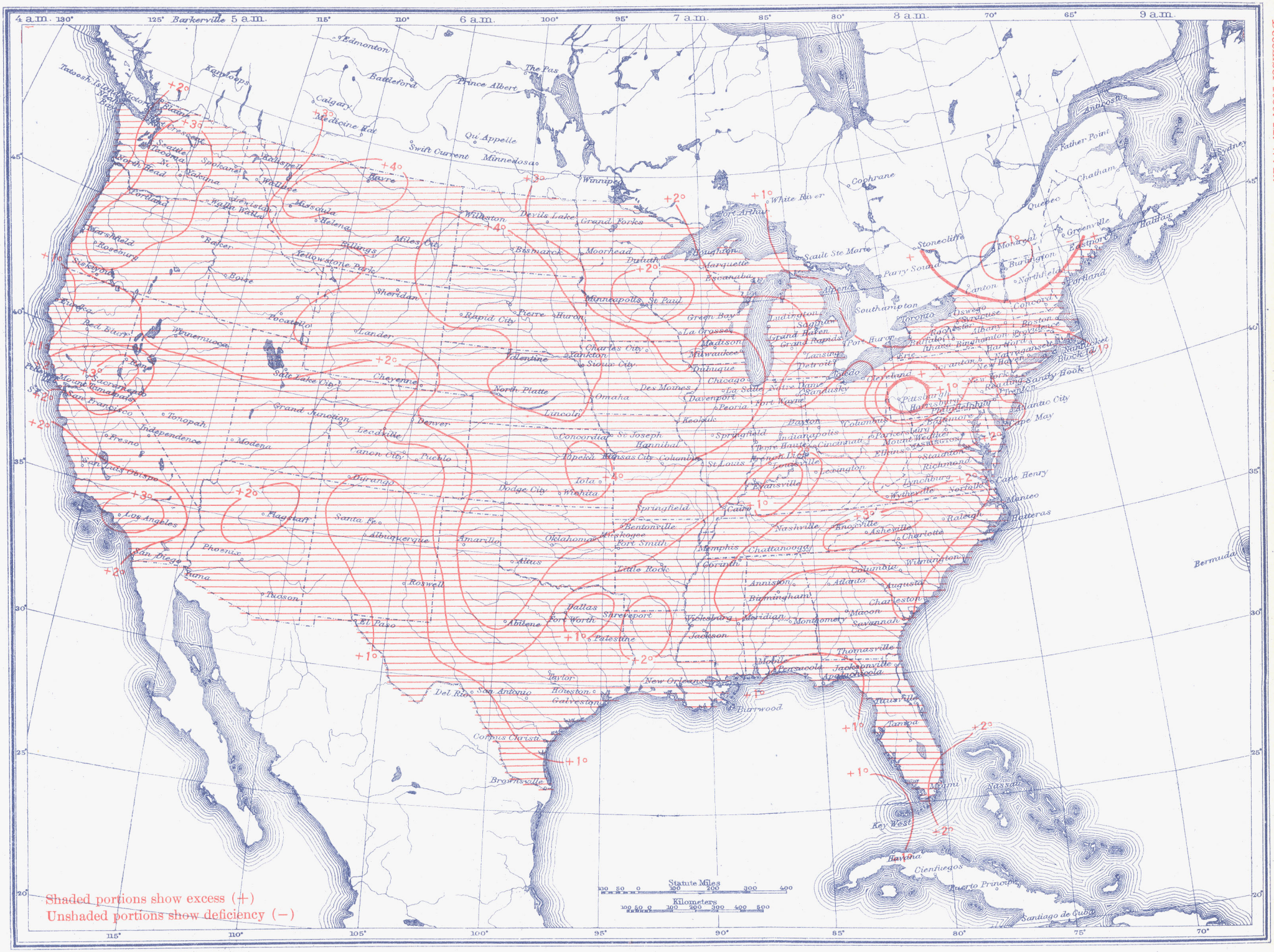
The year was considerably drier than 1938, when most States west of the Mississippi River and over half of those to eastward received above-normal precipitation.

Table 2 shows the percentage of normal precipitation by months for each of the 42 climatological sections. This table, like table 1, is based on section averages, and gives an accurate picture of precipitation distribution throughout the year.

The winter of 1939 (including December of the preceding year) was abnormally wet rather generally in the eastern United States, and in the Southwest, with much the greater portion of the country having above-normal amounts. Heavy snows occurred in most western mountain sections the latter part of the season.

The spring was decidedly dry with only a few States from the Mississippi Valley eastward having somewhat more than normal rainfall. From the Great Plains westward all States had deficiencies.

# Annual Temperature Departures (°F.) in the United States, 1939



The summer was relatively wet to eastward of the Great Plains, except in the Northeast, but rainfall was deficient in nearly all sections from the Great Plains westward. The fall season was extremely dry over large areas, although amounts of precipitation were decidedly above normal in Utah, Colorado, and Arizona. From the Rocky Mountains eastward it was the driest fall of record, considering the area as a whole.

Alabama, with 59.33 inches, had the largest average total for the year, and Nevada, with 8.45 inches, the least, although this amount was only slightly below the normal. The total yearly falls in the Great Plains and Central Rocky Mountain States were as follows: North Dakota 14.15 inches, the least since 1936; South Dakota 15.71 inches, also the smallest since 1936; Nebraska 16.28 and Oklahoma 20.08 inches. Colorado had only 10.68 inches, somewhat less than the previous driest year of record, 1934, in which only 10.89 inches fell. The average for Wyoming was 9.48 inches, also somewhat lower than the previous driest year, 9.81 inches in 1902. The California average of 15.85 inches was the least since 1932.

Tornadoes, duststorms, and other outstanding features of the weather of 1939 are discussed elsewhere in this issue of the REVIEW.

TABLE 1.—*Monthly and Annual Temperature Departures from Normal for the Year 1939*

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ala. | +4.6 | +4.7 | +3.6 | −0.9 | −0.3 | +0.8 | +0.6 | −1.1 | +1.6 | +2.2 | −2.0 | +2.2 | +1.3 |
| Ariz. | +.2 | −8.9 | −.3 | +2.3 | +1.6 | −.2 | +1.1 | +.7 | −.7 | −1.4 | +2.5 | +4.8 | +.1 |
| Ark. | +4.1 | .0 | +2.7 | −2.1 | +.2 | +.7 | +1.5 | +.1 | +5.4 | +2.7 | −2.5 | +2.7 | +1.3 |
| Calif. | −.1 | −5.5 | −1.1 | +2.7 | +.3 | −1.1 | −.7 | +.8 | +1.4 | −.3 | +1.2 | +3.5 | +.1 |
| Colo. | +1.9 | −7.9 | +1.0 | +2.3 | +3.6 | +.8 | +2.5 | +.9 | +3.6 | +1.1 | +2.5 | +6.6 | +1.6 |
| Fla. | +1.6 | +5.6 | +2.8 | +.8 | −.7 | +.5 | .0 | −1.3 | +.9 | +1.6 | −2.1 | −.5 | +.8 |
| Ga. | +2.4 | +5.5 | +2.4 | −.6 | −1.1 | +1.4 | +.4 | −1.2 | +1.4 | +2.0 | −1.9 | +.9 | +1.0 |
| Idaho | +3.7 | −5.3 | +1.1 | +2.7 | +3.1 | −2.6 | +.7 | +1.3 | +1.4 | +.3 | +2.8 | +7.8 | +1.4 |
| Ill. | +6.6 | +.7 | +2.6 | −2.7 | +3.4 | +1.5 | +.2 | −1.0 | +4.5 | +2.4 | −.2 | +4.7 | +1.9 |
| Ind. | +5.4 | +1.7 | +2.2 | −3.0 | +2.9 | +2.1 | −.5 | +.3 | +4.7 | +2.8 | −1.3 | +3.2 | +1.7 |
| Iowa | +10.1 | −2.0 | +1.8 | −.9 | +6.3 | +1.8 | +1.6 | −1.5 | +5.4 | +1.8 | +3.6 | +8.3 | +3.0 |
| Kans. | +8.4 | −2.6 | +2.1 | −.2 | +4.6 | +1.5 | +4.3 | +.2 | +5.7 | +3.9 | +1.1 | +5.9 | +2.9 |
| Ky. | +4.4 | +3.2 | +3.0 | −2.5 | +.9 | +1.2 | −.6 | −.5 | +3.9 | +2.7 | −2.8 | +1.1 | +1.2 |
| La. | +3.5 | +2.5 | +2.0 | −1.0 | −.4 | +.6 | +.9 | +.1 | +1.9 | +1.3 | −2.2 | +3.0 | +1.0 |
| Md.-Del. | +1.4 | +6.0 | +1.8 | −.5 | +2.6 | +2.7 | −1.4 | +3.0 | +1.5 | +1.1 | −1.6 | +2.4 | +1.6 |
| Mich. | +3.0 | +.4 | −.9 | −2.2 | +3.5 | +2.3 | +1.5 | +2.4 | +1.9 | +.1 | +.1 | +5.8 | +1.5 |
| Minn. | +5.9 | −7.1 | −1.4 | −2.6 | +5.5 | +.7 | +1.6 | +1.2 | +4.2 | −1.5 | +5.8 | +10.7 | +1.9 |
| Miss. | +3.0 | +2.7 | +2.8 | −1.9 | −.3 | +.7 | +.9 | −.2 | +2.9 | +1.7 | −2.9 | +1.8 | +.9 |
| Mo. | +8.0 | −.1 | +3.1 | −1.8 | +2.9 | +1.0 | +2.0 | −1.1 | +6.1 | +3.6 | −.9 | +4.6 | +2.3 |
| Mont. | +8.9 | −6.2 | +2.1 | +2.7 | +3.8 | −4.0 | +2.1 | +1.2 | +2.4 | +.3 | +5.7 | +8.7 | +2.3 |
| Nebr. | +8.9 | −4.6 | +3.2 | +.3 | +6.6 | +.9 | +4.7 | +.3 | +5.2 | +2.0 | +3.4 | +7.7 | +3.2 |
| Nev. | +3.0 | −5.8 | +2.2 | +4.0 | +3.5 | +.4 | +1.5 | +2.7 | +1.7 | +.6 | +3.1 | +7.9 | +2.1 |
| N. England | −.8 | +2.7 | −4.5 | −3.4 | +.1 | −.1 | +.2 | +3.8 | −.5 | .0 | −3.1 | +.5 | −.4 |
| N. J. | .0 | +5.8 | +1.0 | −1.4 | +2.9 | +2.0 | −.3 | +3.5 | +.6 | +.2 | −2.1 | +1.5 | +1.1 |
| N. Mex. | −.3 | −8.2 | +.6 | +1.3 | +1.2 | +.9 | +.2 | −.2 | +1.8 | −.8 | −.5 | +3.9 | .0 |
| N. Y. | +.2 | +4.1 | −2.2 | −2.5 | +2.5 | +1.0 | +.4 | +4.0 | −.9 | .0 | −3.0 | +1.4 | +.4 |
| N. C. | +1.9 | +5.7 | +3.1 | +.1 | −.4 | +3.2 | −.6 | .0 | +1.8 | +2.7 | −3.0 | −.3 | +1.2 |
| N. Dak. | +8.7 | −10.2 | −.5 | +.2 | +6.5 | −2.4 | +3.7 | +2.1 | +2.1 | −2.5 | +8.2 | +13.7 | +2.5 |
| Ohio | +4.8 | +3.4 | +1.9 | −2.6 | +3.2 | +3.0 | −.8 | +1.0 | +4.4 | +2.6 | −1.1 | +3.3 | +1.9 |
| Okla. | +5.9 | −2.1 | +3.4 | −.5 | +3.1 | +1.4 | +2.5 | +.7 | +5.7 | +4.1 | −1.3 | +5.3 | +2.4 |
| Oreg. | +3.0 | −2.9 | +1.4 | +3.0 | +2.3 | −2.2 | +1.1 | +1.5 | +2.1 | +.1 | +.8 | +5.8 | +1.3 |
| Pa. | +1.8 | +5.3 | +.9 | −1.9 | +3.2 | +1.8 | −.5 | +3.0 | +1.7 | +1.0 | −1.6 | +2.6 | +1.4 |
| S. C. | +2.3 | +5.8 | +3.1 | +.1 | −1.1 | +3.1 | +.2 | −.4 | +1.8 | +2.8 | −3.4 | +.2 | +1.2 |
| S. Dak. | +8.9 | −7.9 | +2.6 | +.3 | +7.8 | −.1 | +4.4 | +1.0 | +3.9 | +.1 | +5.8 | +10.0 | +3.1 |
| Tenn. | +3.5 | +3.4 | +2.7 | −2.0 | +.1 | +1.6 | +.7 | −.2 | +3.7 | +3.2 | −2.7 | +1.5 | +1.3 |
| Tex. | +2.7 | −2.8 | +2.2 | +.5 | +2.2 | +1.2 | +1.4 | −.5 | +2.3 | +1.8 | −3.0 | +3.5 | +1.0 |
| Utah | +1.4 | −9.6 | +.8 | +3.6 | +2.7 | −.5 | +.7 | +1.2 | +1.1 | +.5 | +3.2 | +7.3 | +1.0 |
| Va. | +2.6 | +5.9 | +2.0 | −.6 | +1.3 | +3.1 | −1.3 | −.9 | +1.7 | +1.5 | −2.4 | +1.5 | +1.2 |
| Wash. | +5.8 | −2.2 | +.5 | +2.4 | +1.9 | −2.0 | +.9 | +2.0 | +2.1 | +.6 | +2.9 | +6.5 | +1.8 |
| W. Va. | +3.6 | +5.6 | +2.4 | −1.8 | +1.8 | +3.0 | −1.1 | +.9 | +2.3 | +1.3 | −2.4 | +2.0 | +1.5 |
| Wis. | +6.8 | −2.6 | −.7 | −2.8 | +4.3 | +1.2 | +1.4 | +1.0 | +2.1 | .0 | +2.3 | +8.3 | +1.8 |
| Wyo. | +4.0 | −8.0 | +2.4 | +3.5 | +4.3 | −2.2 | +2.0 | −.5 | +2.1 | +1.2 | +3.4 | +8.0 | +1.7 |

TABLE 2.—*Percentage of Normal Precipitation, 1939*

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ala. | 99 | 194 | 87 | 82 | 139 | 146 | 89 | 233 | 119 | 14 | 26 | 67 | 108 |
| Ariz. | 84 | 94 | 65 | 88 | 12 | 11 | 51 | 103 | 335 | 55 | 136 | 29 | 89 |
| Ark. | 145 | 258 | 78 | 146 | 96 | 110 | 88 | 68 | 53 | 55 | 91 | 58 | 104 |
| Calif. | 67 | 54 | 81 | 32 | 99 | 38 | 114 | 70 | 370 | 87 | 17 | 66 | 91 |
| Colo. | 171 | 112 | 88 | 51 | 54 | 59 | 41 | 55 | 83 | 50 | 32 | 51 | 71 |
| Fla. | 59 | 73 | 50 | 151 | 124 | 138 | 105 | 153 | 85 | 71 | 62 | 78 | 96 |
| Ga. | 92 | 187 | 91 | 101 | 119 | 106 | 84 | 137 | 78 | 12 | 30 | 78 | 93 |
| Idaho | 81 | 121 | 74 | 50 | 49 | 107 | 113 | 27 | 98 | 101 | 16 | 122 | 80 |
| Ill. | 137 | 156 | 109 | 148 | 58 | 126 | 103 | 141 | 20 | 79 | 48 | 50 | 98 |
| Ind. | 133 | 172 | 106 | 166 | 38 | 160 | 125 | 78 | 25 | 100 | 47 | 45 | 100 |
| Iowa | 80 | 162 | 103 | 76 | 51 | 114 | 84 | 133 | 22 | 62 | 31 | 52 | 81 |
| Kans. | 118 | 121 | 119 | 76 | 62 | 115 | 43 | 111 | 11 | 30 | 63 | 95 | 80 |
| Ky. | 127 | 232 | 123 | 153 | 34 | 143 | 117 | 77 | 43 | 78 | 33 | 59 | 102 |
| La. | 116 | 124 | 60 | 52 | 146 | 95 | 97 | 96 | 83 | 66 | 88 | 77 | 92 |
| Md.-Del. | 111 | 169 | 114 | 144 | 32 | 167 | 93 | 116 | 78 | 125 | 51 | 58 | 105 |
| Mich. | 119 | 160 | 81 | 107 | 74 | 158 | 58 | 169 | 81 | 94 | 33 | 70 | 100 |
| Minn. | 163 | 193 | 51 | 70 | 73 | 127 | 71 | 122 | 49 | 83 | 5 | 52 | 88 |
| Miss. | 136 | 166 | 95 | 80 | 125 | 163 | 92 | 66 | 100 | 44 | 41 | 77 | 99 |
| Mo. | 123 | 158 | 97 | 129 | 87 | 117 | 77 | 123 | 20 | 66 | 99 | 71 | 97 |
| Mont. | 74 | 107 | 73 | 70 | 90 | 143 | 49 | 57 | 71 | 81 | 23 | 110 | 79 |
| Nebr. | 127 | 121 | 110 | 57 | 72 | 102 | 55 | 72 | 21 | 42 | 5 | 100 | 74 |
| Nev. | 81 | 77 | 97 | 101 | 83 | 39 | 167 | 67 | 327 | 193 | 46 | 43 | 110 |
| N. England | 78 | 107 | 122 | 137 | 53 | 98 | 61 | 103 | 76 | 134 | 31 | 94 | 91 |
| N. J. | 111 | 154 | 128 | 142 | 38 | 96 | 49 | 148 | 42 | 124 | 58 | 42 | 94 |
| N. Mex. | 248 | 86 | 101 | 99 | 63 | 52 | 96 | 71 | 114 | 79 | 94 | 94 | 100 |
| N. Y. | 98 | 140 | 105 | 113 | 48 | 85 | 60 | 76 | 93 | 107 | 53 | 99 | 90 |
| N. C. | 109 | 191 | 90 | 99 | 69 | 93 | 132 | 126 | 36 | 66 | 72 | 66 | 96 |
| N. Dak. | 100 | 137 | 51 | 60 | 66 | 134 | 72 | 101 | 43 | 71 | 5 | 54 | 74 |
| Ohio | 92 | 166 | 121 | 160 | 34 | 173 | 109 | 60 | 70 | 118 | 35 | 53 | 99 |
| Okla. | 191 | 124 | 86 | 72 | 79 | 139 | 55 | 89 | 11 | 57 | 71 | 64 | 86 |
| Oreg. | 76 | 114 | 81 | 22 | 61 | 87 | 109 | 83 | 53 | 105 | 14 | 146 | 79 |
| Pa. | 97 | 150 | 104 | 108 | 41 | 107 | 73 | 71 | 85 | 119 | 34 | 71 | 88 |
| S. C. | 87 | 207 | 89 | 103 | 95 | 86 | 105 | 129 | 53 | 27 | 46 | 76 | 92 |
| S. Dak. | 173 | 118 | 31 | 48 | 78 | 118 | 71 | 84 | 61 | 88 | 1 | 51 | 77 |
| Tenn. | 128 | 225 | 93 | 111 | 81 | 141 | 87 | 79 | 44 | 44 | 44 | 72 | 96 |
| Tex. | 161 | 100 | 50 | 48 | 85 | 98 | 99 | 91 | 38 | 54 | 88 | 73 | 82 |
| Utah | 115 | 105 | 68 | 66 | 70 | 116 | 61 | 63 | 261 | 119 | 15 | 37 | 91 |
| Va. | 106 | 169 | 85 | 95 | 74 | 109 | 139 | 127 | 37 | 108 | 90 | 62 | 100 |
| Wash. | 116 | 121 | 74 | 38 | 76 | 104 | 129 | 57 | 46 | 88 | 50 | 139 | 86 |
| W. Va. | 99 | 183 | 107 | 153 | 34 | 143 | 127 | 54 | 76 | 117 | 35 | 74 | 100 |
| Wis. | 157 | 150 | 57 | 90 | 76 | 134 | 57 | 111 | 72 | 75 | 19 | 64 | 88 |
| Wyo. | 100 | 112 | 58 | 60 | 74 | 106 | 62 | 71 | 81 | 73 | 1 | 55 | 71 |

# PRELIMINARY REPORT ON TORNADOES IN THE UNITED STATES DURING 1939

BY R. J. MARTIN

[Weather Bureau, Washington, D. C., February 1940]

A preliminary report on the tornadoes which occurred within the United States during 1939 is here included in the December REVIEW, as has been the custom in recent years. A more detailed study will appear in the Meteorological Yearbook for 1939 which will be issued the latter part of 1940 or early in 1941. Practically all of the information contained in the present summary has been abstracted from the monthly REVIEW table of "Severe Local Storms" compiled from the reports of many observers and the various Section Directors of the Bureau. It must be remembered that all the statistics presented in this preliminary report are subject to change in the detailed study.

One hundred and thirty-eight tornadoes were reported during the year, with a death toll of 98, and property losses of more than $5,226,230. April, with 42 tornadoes and 58 fatalities, was the month with the greatest number of storms and largest loss of life. Approximately 30 percent of the year's tornadoes and over 59 percent of the total deaths occurred in this month, although property damage was exceeded by both June and August losses.

The spring season, March, April, and May, had 69 tornadoes, or exactly 50 percent of the year's total. Summer (June, July, and August) had 47 tornadoes, or about 34 percent. Tornado deaths during the Spring amounted to 69, or over 70 percent of the year's casualties. Tornadoes occurred without loss of life in July and October. No tornadoes were reported in November and December.

Arkansas, with 35 fatalities, was the State reporting the greatest number of deaths from tornadoes during the year. Texas was second with 12, Louisiana and Minnesota tied for third place with 10 deaths each. Oklahoma reported 7 fatalities, Tennessee and North Carolina 5 each, Florida 4, Alabama 3, Michigan 2, and New York, Virginia, South